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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/018,387	06/05/2002	John Gordon Rushbrooke	602-1551	4707
23644	7590	02/01/2006		
BARNES & THORNBURG, LLP P.O. BOX 2786 CHICAGO, IL 60690-2786			EXAMINER LAUCHMAN, LAYLA G	
			ART UNIT	PAPER NUMBER
			2877	

DATE MAILED: 02/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/018,387

Applicant(s)

RUSHBROOKE ET AL.

Examiner

L. G. Lauchman

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 17 November 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 110-153 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 112-144 is/are allowed.
- 6) ☒ Claim(s) 110, 111 and 144-153 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “additional shutter means” of Claims 137 and 145 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 148-153 are rejected under 35 U.S.C. 102(e) as being anticipated by Volcker et al (US 6,686,582) as admitted prior art (see page 6 of the specifications, second paragraph).

The patent teaches a plurality of single channel optical systems and photoelectric detectors or detecting areas are arranged in parallel to form a plurality of reading heads arranged side-by-side so as simultaneously to read a corresponding plurality of adjacent sample sites, wherein the reading heads are independently adjustable so that each is accurately positionable over a sample site. (see entire patent, and Figs. 1 and 2).

The optical systems are arranged in a single line, use independent confocal systems, light is a single light source split into a plurality of beams and conveyed by as fiber optic cable.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 110 and 111 are rejected under 35 U.S.C. 103(a) as being unpatentable over Volcker et al (US 6,686,582), in view of Tiziani et al (Applied Optics, vol. 33, No. 4), and further in view of Dandliker et al (US Re.34,782)

Volcker teaches (see Figs. 2 and 1) a method, comprising focusing light emitted from each sample 11 (see Fig. 1) at infinity so as to form a parallel beam, further using a lens 42 to re-establish a parallel array of light beams so as to present to an addressable detector array a plurality of parallel light paths, and individually addressing different regions of the detector array onto which the parallel light paths impinge, and storing data relating to the quantity of incident light on each region of the detector array. Objective lenses are arranged above the sample array.

Volcker does not teach the pinhole aperture positioned at the focal point of the focusing lens. Tiziani et al use a small aperture for detection of light emanating from the focal point of the objective lenses of a microlens array in a similar method and apparatus. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the pinhole aperture in the invention of Volcker as taught by Tiziani, since the pinhole would provide attenuating unwanted fluorescence and improve the resolution of the optical system.

The combination of inventions of Volcker and Tiziani does not teach a shutter for inhibiting the transfer of light to the detector as it is claimed. However, Dandliker describes an apparatus for measuring fluorescence having a shutter 26 (see col. 8, line 67 through col. 9, line

23; col. 9 lines 51-66; col. 10, lines 56-59) for controlling fluorescence detected by the detector 34). It would have been obvious to one skilled in the art at the time the invention was made to provide a shutter Dandliker in the combination of inventions of Volker and Tiziani, in order to provide detecting within a particular time period so as to optimize the detection of the particular fluorescence.

As to the location of the objective lens, if the system of Volcker the positions of the detector and the sample were switched so as the detector is below the sample and the remaining of the structure stayed the same, the lens 42 would have been below the sample. Switching the position of the sample and the detector would be obvious to one skilled in the art, since such change would not affect the operable capabilities of the Volcker's optical system and would accomplish the same results.

Claim 144 is rejected under 35 U.S.C. 103(a) as being unpatentable over Volcker et al (US 6,686,582), and further in view of Tiziani et al (Applied Optics, vol. 33, No. 4)

Volcker teaches (see Fig. 2) a method of imaging a plurality of micro-sample light emitting sites simultaneously onto separately addressable detectors (see col. 2, lines 33-43), comprising: locating a corresponding plurality of objective lenses 2i adjacent to the micro-sample array 11i, the latter being located at near the focal point of each of the lenses...., focusing the beams with a focus lens 41 through a single point (see lens 5), collecting the beams beyond that point by detector lens means 42 which serve to reconstitute the parallel beams for presentation to the detectors 6, the detector array. Volcker does not teach the pinhole aperture positioned at the focal point of the focusing lens. Tiziani et al use a small aperture for detection

of light emanating from the focal point of the objective lenses of a microlens array in a similar method and apparatus. It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the lens 5 with the pinhole aperture in the invention of Volcker, since the pinhole would to provide attenuating unwanted fluorescence and improve the resolution of the optical system. The detector array is a CCD array, which is equivalent to an array of photomultipliers (see US Pat. No. 5,959,292, col. 8, lines 59-62; US Pat. No. 5,846,719, col. 25, lines 55-60).

Claims 145-147 are rejected under 35 U.S.C. 103(a) as being unpatentable over Volcker et al (US 6,686,582), in view of Tiziani et al (Applied Optics, vol. 33, No. 4), and further in view of Dandliker et al (US Re.34,782).

Volcker teaches (see Figs. 2 and 1) a method, comprising focusing light emitted from each sample 11 (see Fig. 1) at infinity so as to form a parallel beam, further using a lens 42 to re-establish a parallel array of light beams so as to present to an addressable detector array a plurality of parallel light paths, and individually addressing different regions of the detector array onto which the parallel light paths impinge, and storing data relating to the quantity of incident light on each region of the detector array. Objective lenses are arranged above the sample array.

Volcker does not teach the pinhole aperture positioned at the focal point of the focusing lens. Tiziani et al use a small aperture for detection of light emanating from the focal point of the objective lenses of a microlens array in a similar method and apparatus. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the pinhole

aperture in the invention of Volcker as taught by Tiziani, since the pinhole would provide attenuating unwanted fluorescence and improve the resolution of the optical system.

The combination of inventions of Volcker and Tiziani does not teach a shutter for inhibiting the transfer of light to the detector as it is claimed. However, Dandliker describes an apparatus for measuring fluorescence having a shutter 26 (see col. 8, line 67 through col. 9, line 23; col. 9 lines 51-66; col. 10, lines 56-59) for controlling fluorescence detected by the detector 34). It would have been obvious to one skilled in the art at the time the invention was made to provide a shutter Dandliker in the combination of inventions of Volcker and Tiziani, in order to provide detecting within a particular time period so as to optimize the detection of the particular fluorescence.

Volcker does not teach a pinhole aperture located in front of the detector lens, circuit means and computing and analyzing circuit means along with the memory means. Tiziani et al use a small aperture for detection of light emanating from the focal point of the objective lenses of a microlens array in a similar method and apparatus. The article also teaches computing, analyzing and memory means (see p. 569, paragraph 3). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the pinhole aperture in the invention of Volcker as taught by Tiziani, since the pinhole would provide an image of the micro-sample light emissions in the plane of an array of photoelectric detectors. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the invention of Volcker with the computing, analyzing and memory means in order to improve the efficiency of the fluorescence measurement. The detector array is a CCD array, which is equivalent to an array of photomultipliers.

Allowable Subject Matter

Claims 112-143 allowed.

The following is an examiner's statement of reasons for allowance:

The prior art of record taken along or in combination, fails to disclose or render obvious apertured masks placed on either side of the filter to collimate the parallel beam to reduce background and cross-talk, a beam splitter in the optical path between the objective lenses and the focusing lens to enable light to pass from the lenses to the focusing lens, in combination with the rest of the limitations of the independent claims. Volcker suggests using aperture masks, however, the location of the masks in relation to the filter is not disclosed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

Applicant's arguments, filed 11/17/2005, with respect to claims 112-143 have been fully considered and are persuasive. The rejection of Claims 112-143 has been withdrawn.

Applicant's arguments filed 11/17/2005, with respect to claims 110, 111, 144, 145, 148-153 have been fully considered but they are not persuasive.

Claim Clarity

The applicants state that the additional/further shutter means was disclosed in claim 28 in the original PCT Application. However, the feature is not shown in the drawings, and therefore it is not clear where the additional shutter means is positioned in relation to "that associated with the light source."

Claims 110, 111

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivations of combining the references are indicated in the rejection.

In response to applicant's argument that the reference of Tiziani concerns the use of confocal microscopy to measure surface topography, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, the function of the pinhole of Tiziani is to reduce the light flux and image the light coming from the sample on to the detector.

Claims 144, 145

In response to applicant's argument that no support is provided for showing that a CCD array is equivalent to an array of photomultipliers. The US patents 5,846,719 and 5,959 disclose

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methods for detecting and identifying fluorescence by using either photomultipliers or a CCD array, as equivalent detectors.

Claims 148-153

In response to applicant's argument that the examiner merely cites the entire reference without indicating the disclosure of the feature, the examiner should note that, in the specification of the present application, on page 6, second paragraph, the applicants specifically disclose that the reading heads in the German application are arranged side-by-side so as to simultaneously to read a corresponding plurality of adjacent sites.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to L. G. Lauchman whose telephone number is (571) 272-2418. The examiner's normal work schedule is 8:00am to 4:30pm (EST), Monday through Friday. If attempts to reach examiner by the telephone are unsuccessful, the examiner's supervisor Gregory J. Toatley, Jr. can be reached on (571) 272-2059, ext. 77.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry of a general nature or relating to the status of this application should be directed to the TC receptionist whose telephone number is (571) 272-1562.

A handwritten signature in black ink, appearing to read 'L. G. Lauchman', with a long horizontal flourish extending to the right.

L. G. Lauchman
Primary Examiner
Art Unit 2877

January 30, 2006